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# Sarcoglycan sub-complex in the adipose organ: a molecular and immunofluorescence study

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The sarcoglycan sub-complex (SGC) is made up of six glycoproteins which connect the cytoskeleton to the extracellular matrix in skeletal muscle. Recent data show that this complex is also expressed in epithelial tissue such as gingival, breast and prostatic ones [1]. The adipose organ is organized in multiple fat depots consisting of white and brown adipose cells. White adipocytes can store energy in triglycerides; brown adipocytes can dissipate energy for thermogenesis. It has been demonstrated that white adipocytes transdifferentiate to brown adipocytes after cold exposure [3].

In this study we examined the expression of sarcoglycans (SGs) in the adipose organ from two groups of mice: the first group was exposed at 25 C°, as control, and the second one was exposed at low temperature (4 C°) for 24 hours and 4 days. Fat depots from the visceral and interscapular region, but also from the mammary gland, have been examined by histological, immunofluorescence and molecular techniques.

Results have shown that SGC is expressed in the adipose organ, both in brown and white adipocytes of mice exposed at 25 C°. The main results is that the expression level of all sarcoglycans increase in cold exposure experiment.

For the first time the expression of all SGs in the adipose organ has been demonstrated, both at mRNA and protein levels. Since we found an increase in SGs expression after transdifferentiation from white to brown adipocytes cold exposure induced, we hypothesize that sarcoglycans could be associated with β3 adrenergic receptor; sarcoglycans associations with other receptors, as GABAr, has been already demonstrated in central nervous system. Although that, the function of these glycoproteins in the adipose organ remain still unclear and further investigation are required.

## References

[1] Anastasi (2010) Sarcoglycan[s] are not muscle-specific: hypothetical roles. Ital J Anat Embryol. 115(1-2):19-24.
[3] Barbatelli et al. (2010) The emergence of cold-induced brown adipocytes in mouse white fat depots is determined predominantly by white to brown adipocyte transdifferentiation. Am J Physiol Endocrinol Metab. 298(6):1244-53.

Keywords
White adipocyte, brown adipocyte, sarcoglycans, mice, cold-exposure